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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

WIRELESS TELEGRAPHY AND THE "ST. LOUIS."

The painful uncertainty attending the belated "St. Louis," of which nothing was heard, from the time she left Cherbourg until she was sighted at Nantucket, a week overdue, suggests that for passenger ships at least, the time will be welcomed when every vessel is equipped with a wireless telegraph outfit. Although none of the vessels so equipped would be capable of repeating Marconi's feat when he communicated from one of the vessels of the American Line over 1,500 miles at sea with the powerful Poldhu station, a range of say 200 miles should be quite within commercial practicability. Considering the crowded condition of the various steamship lanes across the Atlantic, it would be impossible, were all passenger ships so provided, for a vessel to remain unspoken for more than a day or two at the longest; and a liner disabled in mid-Atlantic should be able to communicate from ship to ship with her home port and news of her trouble be made known, long before the day set for her arrival. In this way an enormous amount of anxiety could be spared to relatives and friends on the all-too-frequent occasions when transatlantic vessels are disabled. Indeed, we consider that just as soon as wireless telegraphy has been placed on a thorough commercial basis, it would be quite within reason for a law to be passed requiring all ships to install some one of the wireless telegraph systems which will be on the market.

MAGNITUDE OF COMMERCE ON THE LAKES.

The close of November on the Great Lakes usually marks the end of the season of through navigation; and the government statistics show that for the first eleven months of the past year 77,408 vessels, of over seventy-one millions net tonnage, were reported as arrivals, and 77,899 clearances were reported, of over seventy-two million net tons. There are twenty individual ports on the Great Lakes having a registered tonnage ranging from one million to over five million tons. Cleveland heads the list with 5,037,282 tons; and five other ports, viz., Duluth, West Superior, Milwaukee, Chicago and Buffalo, recorded over four million tons of arrivals. The enormous volume of this movement is only appreciated when it is compared with similar marine operations on the ocean frontage. New York, during the entire year 1902, is credited with 8,982,767 tons of arrivals; London had entrances in 1901 amounting to 9,992,753 tons; and Hong Kong reported 8,626,614 tons entering in the year 1900.

NEW METHODS OF TUNNELING.

It was inevitable that the construction of the Rapid Transit East River tunnel, and the North and East Rivers tunnels of the Pennsylvania Road, should stimulate inventors to devise new and better means of tunneling through silt or other soft material. All the later methods that have been outlined make provision for supporting the weight of the tunnel upon the firm rock bottom underlying the silt. The Chief Engineer of the North River tunnel, Mr. Jacobs, does this by opening the bottom of the tube at stated intervals, and carrying a concrete-filled cylinder pier down to bed-rock, the weight of the tube and the trains being carried by two parallel trusses resting upon the piers, and constructed within and on each side of the tube itself.

Another system, which has recently been patented by Mr. Sooysmith, employs the freezing process associated with timber piling. When tunneling by this method, a pile foundation is first driven from the river surface throughout the whole length of the tunnel; the material lying just above the piling is then frozen by driving a small pilot tunnel ahead into the surrounding material; and the tunnel is excavated through the material thus frozen, the steel tube resting upon the pile foundation that has been driven for it.

Yet another method is that of Mr. Reno, who drives the tube by the usual pneumatic shield method, and, as it proceeds, takes out a bottom section of the tunnel lining, excavates a rectangular chamber below the tunnel and fills it with a mass of concrete, thus placing the tunnel tube upon a continuous, deep, concrete bed of sufficient weight to prevent vertical or lateral displacement. The great magnitude of the present tunnel schemes, and the importance of securing the system which will be easiest of construction and most secure against deformation when built, render this problem one of the most important that has come up in the world of civil engineering for many years past.

A DOZEN NEW VESSELS FOR THE SHIPPING TRUST.

It will be remembered that when the great steamship merger known as the International Mercantile Marine Company was publicly announced, it was stated that there would be a division of all new steamship construction between American and British yards. The company has just authorized the statement that no less than a dozen Atlantic liners are to be added to their fleets. Of these vessels six will be launched in this country, three of them from the Sparrow's Point yards, Baltimore, and three at the Camden yards, Philadelphia, while the other six will be constructed in British yards. All of these vessels are to be of the mixed freight-and-passenger type which has proved so popular in the "Celtic," although none of the ships will be as large as the latter vessel. Their tonnage will run from 12,000 to 16,000 tons, and the length from about 500 to something over 600 feet. It is significant that not one of these vessels is to be of the high-speed type, the average sea speed varying from 14 to 16 knots. It is well understood that the slower vessels with large cargo-carrying capacity are the most profitable ships afloat, and that their net earning capacity increases rapidly with increasing size.

THE HUMORS OF RAILROADING.

In a recent issue, the Editor, in describing a ride on the locomotive of the Twentieth Century Limited, over the New York Central and Lake Shore Roads, ventured, with many misgivings, to attempt the role of an impressionist. On casually reading over the cold-type result, it has occurred to him that the "impressions" are a little out of balance, inasmuch as he has failed to touch upon the lighter side of the very strenuous life on the footplate; for although the handling of a crack, modern express train on an American railroad is a task calling for the highest qualities of courage, judgment, and eternal vigilance, and although in the background of changing sights, sounds and scenes that go to make up the engineer's life, there is always visible the specter of sudden death or shocking injury, life on the road has still its lighter and humorous phases. One of the "sights" which the privileged guest in the locomotive cab of an express train will be told to watch for, is the taking of water from the trough tanks between the tracks. It is an interesting and even a spectacular sight, particularly if the scoop should be left down a little too long, and the tank should overflow. On the occasion of our ride, when we were making fast time over a stretch of the magnificently-kept roadbed and track of the Lake Shore system, we took water at a trough while we were running at considerably above the regulation speed of 45 miles an hour, to which enginemen, as a rule, are expected to slow down. Now, when a forwardly-projecting scoop is pushed through standing water at a speed of 60 miles an hour, it can be understood that the inrush of water to the tank is in such a volume as to fill it up in an exceedingly short space of time, and hence it requires considerable judgment on the part of the fireman to raise the scoop at the "psychological moment" and avoid an overflow. To provide against rupturing the tank there is a large, square hole cut in the top of the tank at its rear, just opposite the baggage car front platform; and in case of an overflow the water boils out through this opening in a perfect cataract. When the Twentieth Century train was first run over the road, it happened that the tank was overfilled, and the water, rushing out, fell against the front end of the baggage car, burst open the door, rushed through the baggage compartment, poured into the barber's shop, and so scared the tonsorial artist that he stood not on the order of his going, but fled headlong into the smoking compartment, with the foaming flood at his heels. Thereafter, to provide against another accident of the kind, the front door of the baggage car was battened; and the baggage master and barber henceforth pursued their respective callings, dry shod.

The scoop is lifted from the tank by means of an air cylinder. On the occasion when we made the run, the "air failed to act" (at least so said the fireman), with the result that the water continued to rush into the tank long after it was filled, and the writer witnessed a display that was simply magnificent. Tons of water as it boiled over, fell against the front end of the baggage car, and, dividing, rolled off in a splendid cataract at each side of the track. Here, as it struck the gravel ballast, at a velocity of a mile a minute, it acted like water from the nozzle of a gigantic fire hose, and the flying waters spread right and left in a huge cloud of foam and spray that entirely hid the following train from view.

Now, it so happened that once upon a time, subsequent to the closing up of the front door of the baggage car for the reasons above stated, a certain tramp, seeing an opportunity for an unmolested 160-mile ride on one of the fastest trains in the world, stole up on the front platform as the train was starting, and coiled up for the trip. There are two water troughs on this run, at each of which the scoop is used; and whether it was that the firemen accidentally caught sight of the "deadhead," history saith not; but it is a fact that by a curious coincidence, at each trough in succession there was an overflow of the most violent character. At the end of the run, when the engineer was looking over his engine, he was confronted by what he described as the most absolutely washed-out specimen of humanity that he had ever seen, who with the water still in the act of draining itself out of his hair and tattered clothing, placed his hand on the arm of the engineer, with the query: "Say, mister, what was the names of them two rivers we run through back there?"

SUBWAY VENTILATION.

In the present rapid extension of subways and deep tunnels there is a danger of neglecting the all-important question of ventilation. Even in cases where the question has been considered, the means taken to provide for a constant supply of pure air have been more or less inadequate.. Recent tests of air taken from the London tubes at various hours of the day, prove that it becomes vitiated to a degree that is a positive menace to the health of the public. It was found that while samples of air taken at street level outside the stations of the Central London Railway contained an average of 2.83 parts of carbon dioxide per 10,000, tests of air taken at the same time from the interior of the stations, and from the cars within the tubes, showed that on the station platforms the percentage varied from 4.23 to 7.36 parts during the hours of moderate traffic, while during the rush hours the percentage rose from 11.04 parts to 20.46 parts per thousand. Now, when we bear in mind that a percentage of over 6 parts of carbon dioxide in 10,000 is considered to be, to say the least, undesirable, and that in the case of persons of weak constitution this percentage becomes positively harmful, we can understand how very injurious the atmosphere in crowded cars in a subway or tunnel must become, during the rush hours. The SCIENTIFIC AMERICAN has frequently drawn attention to this most important aspect of subway and tunnel construction; and now that the Pennsylvania Road has been granted a franchise for its deep-level tunnels, and the East River and North River tunnels are under construction, the question becomes one of most vital interest to the New York traveling public. We believe that, at present, the subway engineers are trusting to the movement of the trains to produce sufficient ventilation; and, if so, it looks as though they are confusing ventilation and circulation. The movement of trains will produce circulation; but if the air be already vitiated, it will require something more than the mere transfer of the air by the piston-like action of the trains to render it pure. Provision must be made for taking into the tunnels a supply of fresh air and expelling that which has been vitiated, and to secure the best results this action should be constant and not intermittent.

COLONISTS FOR OUR NEW PUBLIC LANDS.

The adoption by Congress of a homestead law for our new insular or colonial possessions will throw open to colonists a new princely domain beyond the seas which will have attractions for tens of thousands of settlers, who will undoubtedly emigrate as soon as adequate laws are enacted to protect them in their rights. The rush for the new homesteads in the Philippine Islands, Porto Rico, Hawaii, Tutuila, and Guam will present one of the most spectacular movements of American population, and will inaugurate an era in our development of lands beyond our own continental border unprecedented in history. The exact effect of this upon the industrial development and expansion of our new colonial possessions can easily be predicted, for similar opening and settlement of public lands have always been attended by rapid growth and improvement of the natural resources of the country.

The public lands in these new islands represent some of the richest and most fertile soils found anywhere in the world, with agricultural, mining, and timber resources scarcely comprehended even by our experts. For centuries these great possibilities for material wealth have remained undeveloped, and they must continue under the control of the people who have always failed to appreciate their opportunities. Under Spanish rule there was little opportunity for ambitious